CLAIMS

1. A rotating machine having a plurality of permanent magnet having changing pluralities in a circumferential direction at regular intervals and a relatively rotatable associated element having a plurality of armatures around which coil windings are formed, the armatures are formed from a lamination of a plurality of electromagnetic steel plates having a thickness in the range of 0.25-0.65mm.

2. A rotating machine as set forth in claim 1 wherein the electromagnetic steel plate are interlocked relative to each other by series of partially punched openings forming holes and projections, which inter-fit with each other so as to line up the electromagnetic steel plates in relationship to each other and to provide a mechanical coupling there between.

3. A rotating machine as set forth in claim 1 wherein the machine comprises an electrical generator.

4. A rotating machine as set forth in claim 3 wherein the permanent magnets rotate and the coil windings are fixed against rotation.

5. A rotating machine as set forth in claim 4 wherein the partially punched openings forming holes and projections are provided in each tooth of the stator core.

6. A rotating machine as set forth in claim 4 wherein an insulating layer is fixed to at least one surface of each of the electromagnetic steel plates.

7. A rotating machine as set forth in claim 1 wherein the magnet electrical angle of the poles of the permanent magnets is set with respect to the rotational axis to be in an electrical range of 120° to 140°.

8. A rotating machine as set forth in claim 7 wherein the magnet electrical angle is equivalent to the length of time a magnetic pole travels two pole pitches which is equivalent to the length of time the electromotive force (voltage) completes one cycle.

9. A rotating machine as set forth in claim 8 wherein the machine comprises an electrical generator.

10. A rotating machine as set forth in claim 9 wherein the permanent magnets rotate and the coil windings are fixed against rotation.

11.   A rotating machine as set forth in claim 10 wherein the electromagnetic steel plate are interlocked relative to each other by series of partially punched openings forming holes and projections, which inter-fit with each other so as to line up the electromagnetic steel plates in relationship to each other and to provide a mechanical coupling there between.